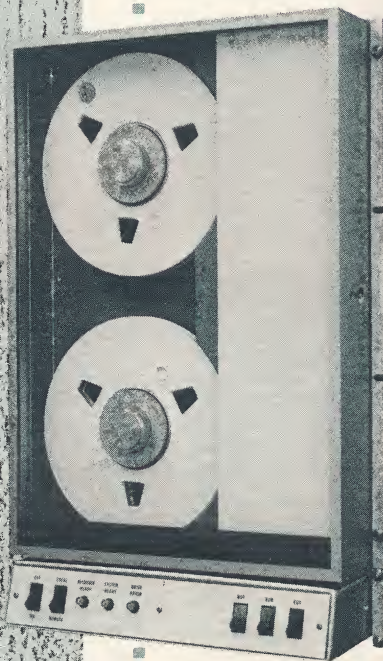


MODEL **150** INCREMENTAL
TAPE
RECORDING
SYSTEM

RECORDS
AS
IT
EXPERIENCES



COOK ELECTRIC ■ DATA-STOR DIVISION

TRANSPORT

The Model 150 Incremental Tape Transport contains its own power supplies and logic electronics, and may be operated independently of the write electronics if desired. The transport electronics include the stepping circuitry, beginning and end of tape sensing, and wind and rewind circuitry.

Tape motion across the recording head is isolated from the reels to provide a constant controlled tape tension across the record head and to prevent reel activity from adversely affecting recording accuracy. This isolation is necessary when operating at high packing densities and when either power transients or shock and vibration conditions occur. Under these circumstances the tape must not shift across the head or tape registration is lost and computer errors will occur.

FUNCTIONS

A single switch controls the basic transport functions. The advance position steps tape at 300 characters until the beginning of tape marker is sensed, stopping the tape automatically. This function reduces operator time and provides automatic tape positioning.

ELECTRONICS CHASSIS

The Model 150 Electronics Chassis provides the circuitry necessary for generating IBM compatible tapes. The electronics consists of write amplifier circuitry (seven channel), gap generation circuitry, which provides all necessary interrecord, end of record, and end of file gaps necessary to generate an IBM compatible tape.

Available as an option is a write echo parity check where the input data is checked for parity at the head. If this option is chosen, input data parity generation must be deleted.

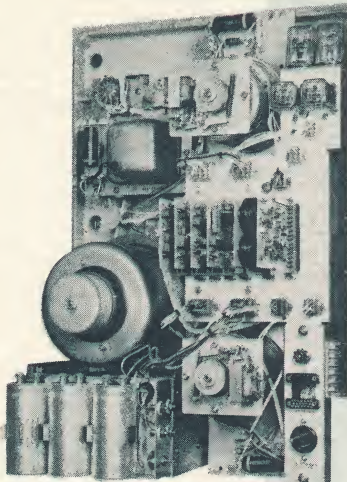
LOCAL CONTROLS

Switches are provided on the control panel to control the following functions locally: ON/OFF, REMOTE/LOCAL, END OF RECORD, BEGINNING OF TAPE, and END OF FILE. Panel mounted indicators display Recorder Ready, System Ready and error conditions.

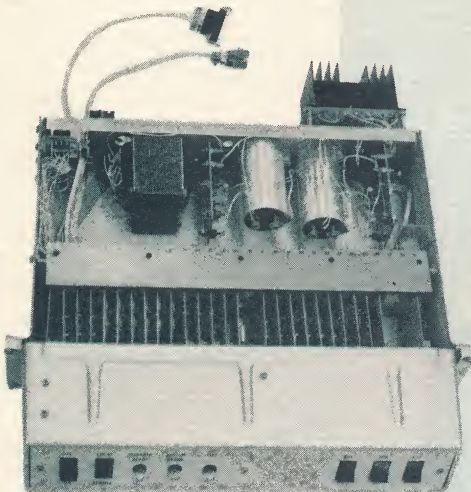
SPECIFICATIONS

Model 150 Incremental Recorder Systems are available for operation at either 200 or 556 characters per inch.

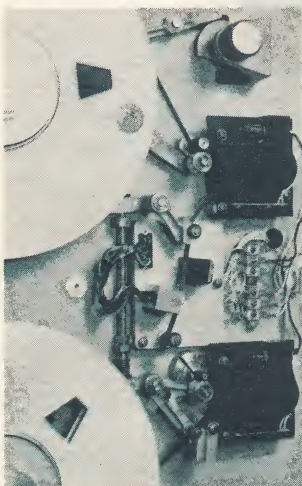
STEPPING RATES	200 char/in.	250 steps/sec.
	556 char/in.	300 steps/sec.
STEP DISTANCE	The tape will move 0.005 inch for every step at 200 characters per inch, or 0.0018 inches for every step at 556 characters per inch. The character spacing accuracy is guaranteed $\pm 10\%$. Cumulative accuracy is guaranteed at $\pm 1\%$.	
SKEW	The total skew from all sources between any two tracks will not exceed 350 microinches.	



REAR VIEW—TRANSPORT

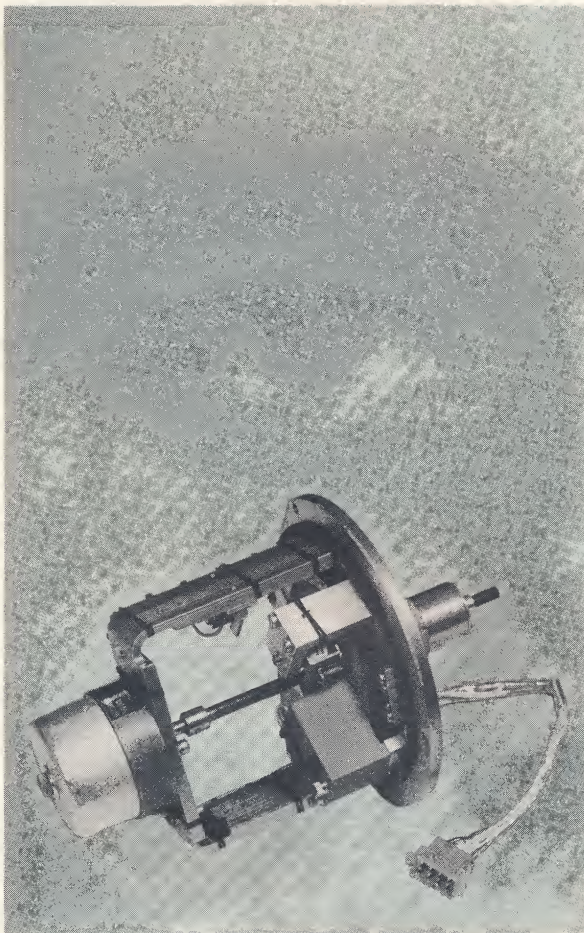


TOP VIEW—ELECTRONICS PACKAGE

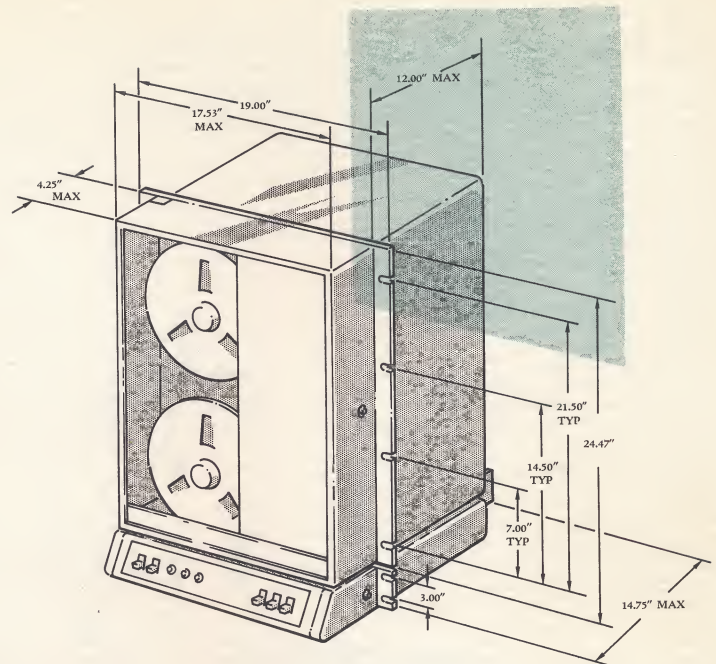
TRANSPORT
FRONT COVER REMOVED

PHYSICAL

MODEL 150 TRANSPORT	
Height:	24½ inches
Width:	Standard 19 inch RETMA
Depth:	12 inches max
Weight:	115 lbs.
MODEL 150 ELECTRONICS CHASSIS	
Height:	3½ inches
Width:	Standard 19 inch RETMA
Depth:	14¾ inches behind front panel
Weight:	25 lbs.



DETAILED VIEW—INCREMENTAL DRIVE



SYSTEM POWER REQUIREMENTS

115/230 vac $\pm 10\%$, 60 cps $\pm 5\%$ @ 400 watts nominal, 500 watts maximum, or 115/230 vac $\pm 10\%$, 50 cps $\pm 5\%$.

REELS AND TAPE

Reel Type: IBM; 10½ diameter, ½ inch wide magnetic tape.

Tape Capacity: 2400 ft. of 1.5 mil base mylar tape.

ENVIRONMENTAL CONDITIONS

The Model 150 Incremental Tape Recorder System operates over a temperature range from 0°C to +50°C and humidity range from 35% to 85% relative humidity.

CONNECTORS

- Power, Amphenol 160-3
- I/O Signals (to data source), 50 pin, MS 24025

OPTIONS

Color (customer supplied paint)	50 or 60 cycle input power	200 or 556 bpi density
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INPUT SIGNALS

Logic "1"	-5.5 to -10.0V.
Logic "0"	0.0±1.0V.

3.0K ohms to signal common 100 pf maximum. Pulse duration 10 us to 1.0 ms. Transition time -1.0 us maximum.

Input control lines

- Step — strobes information stored in the data register onto the tape and advances the tape one character space.
- Generate End of Record — writes longitudinal parity check character and moves tape .75".
- Generate Beginning of File — generates 3.4" length of blank tape.
- Generate End of File — generates 3.4" length of write blank tape 1-2-4-8 tape mark, check character and .75" gap.
- Clear — signal will clear all positions in the data register to the initial zero state.

Data Input

Data—Six or seven channels. Seventh channel input is not used when parity is generated internally.

OUTPUT SIGNALS

Logic "1"	-5.5 to -10.0V
Logic "0"	0.0 to -0.4V

At either level, the output lines will supply 10.0 ma to a more negative load or accept 2.5 ma from more positive load. Transition time is 1.0 us maximum when loaded with 100 pf.

System Ready — indicates system is ready to accept external commands.

Drive Error—indicates incremental drive is malfunctioning.

Beginning of Tape — indicates the Beginning of Tape marker is positioned under the sensor.

End of Tape — indicates the End of Tape marker is positioned under the sensor.

Parity Generator — the output parity generator is available externally

Write Echo — seven output lines, one for each channel are provided.

FUNCTIONAL DESCRIPTION

DATA INPUT

A flux change will be recorded on the corresponding track of the tape if a data input line is in the Logic "1" and a step command is received. No flux change will be recorded if the data line is at Logic "0", and a step command is received.

STEP INPUT

Logic "1" will strobe the record amplifiers and cause the Model 150 to advance the tape one character space. The strobe pulse duration must be between 10.0 microseconds and 1.0 milliseconds.

CLEAR

When the clear line is brought to Logic "1", the NRZ Storage Register will be reset. The clear input, at Logic "1" will hold the register in the reset state regardless of data or step inputs.

CHECK CHARACTER & INTER-RECORD GAP

Logic "1" will advance the tape four increments, write the longitudinal parity check character, and then advance the tape 0.75, inch. The pulse duration must be between 10 microseconds and 1.0 millisecond.

BEGINNING OF TAPE GAP

Logic "1" on this line will reset NRZ Storage Register and hold it reset while causing the tape to advance 3.4 ± 0.8 inches. Pulse duration must be between 10.0 microseconds and 1.0 millisecond. This signal is initiated after the Load Point Marker is positioned under the Load Point Sensor, and thus provides for a gap of erased tape between the marker and the first record.

END OF FILE GAP AND TAPE MARK

Logic "1" will advance the tape in the same manner as the Beginning-of-Tape Gap (3.4 inches), and then write the Tape Mark which is a 1-2-4-8 character, followed by its check character and an inter-record gap.

PARITY GENERATOR

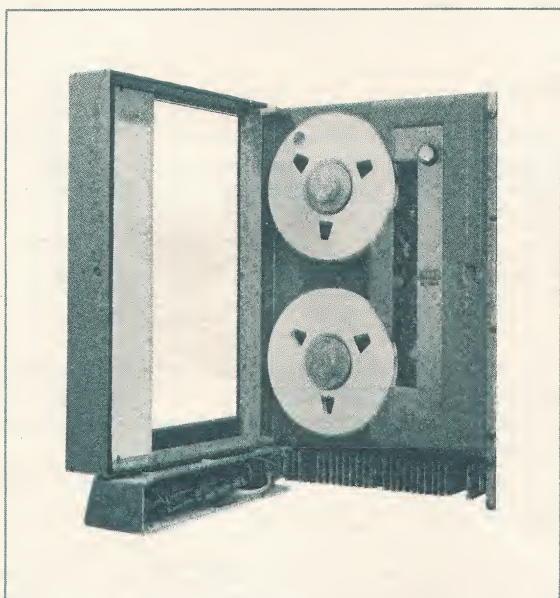
Odd or Even Lateral Parity bits are generated from the six data input lines and recorded on Track 7 (equivalent to IBM Track "C"). Selection of odd or even parity is easily accomplished. The parity signal is available at a 0.0 V and a -6.0 V logic level for external monitoring.

WRITE ECHO PARITY CHECK

Rather than the parity generation function, a write echo parity check may be performed on the data at the write head. A pulse will be generated on the parity line when this function is being used. This line will be valid 5 microseconds after the step command for a minimum of 10 microseconds.

FEATURES

- 200 or 556 Characters Per Inch
- IBM Tape Compatible
- Separate Transport and Electronics Chassis
- Unique Data Validity Circuits
- Esthetically Styled
- Modular Construction
- Quality Circuit Design



FRONT VIEW—DOORS OPEN

The Model 150 Incremental Recording System is self-contained, mounts in a standard 19" RETMA Rack and is of modular construction. The Model 150 is all solid-state; the transport and electronics assembly package operate independently and may be used separately.

The heart of the recorder is the closed loop optical stepping mechanism providing either 250 steps/sec at 200 bpi, or 300 steps/sec at 556 bpi capability. The mechanism is electro-mechanical in nature and derives its accuracy through a precision registration mechanism.

The tape threading path is simple and straight-line. A single multiple function switch controls all functions in the transport. This switch has an unload position which removes all of the mechanical devices from the tape threading path.

A separate control panel on the Electronics Package provides monitoring of all necessary writing functions. The indicators and switches provide the necessary control to manually prepare tape prior to recording.

DESCRIPTION

The Model 150 Incremental Recording System produces computer compatible tapes in response to randomly occurring input data. The System will accept data in six parallel bits and generate the lateral parity; or accept seven bits in parallel with the parity externally generated. All tape gapping operations necessary to generate IBM compatible tapes are preformed internally. The tapes produced on the Model 150 can be directly transferred to 727 or 729 Series Tape Machines, ASC II and other formats can be provided.

The system provides superior accuracy in recording IBM compatible tapes. Character stepping rates to 300 char/sec at 556 bpi with $\pm 10\%$ spacing accuracy provides high performance for all applications. Esthetically styled for business environments, the Model 150 Incremental Recorder blends in with any office decor. Simple tape threading and manual controls allow any office personnel to operate the equipment without training.

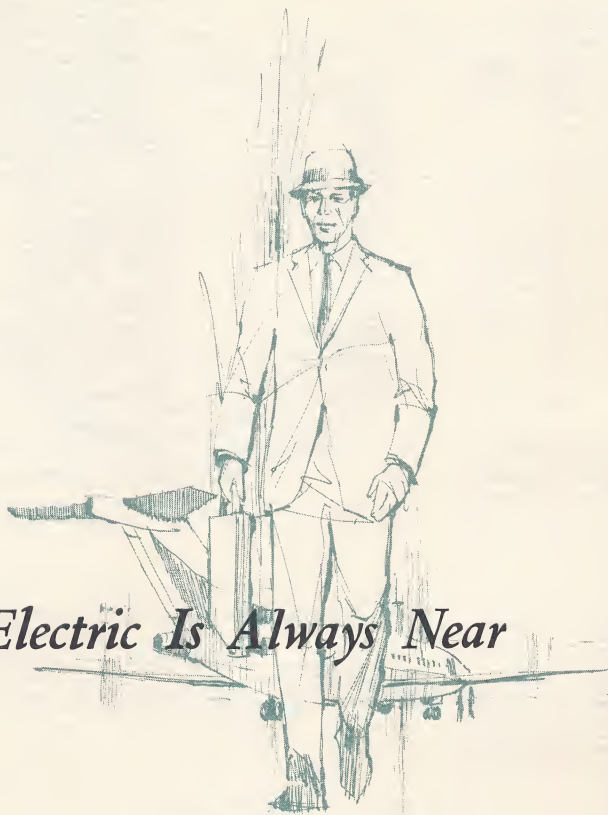
The Model 150's purpose is to provide low cost IBM tape compatibility and economical data exchange between large and small computers.

THE MODEL 150 SPEEDS UP

- Data acquisition systems
- Workflow into shared computers
- Communication terminals
- Tape processing time

AND ELIMINATES

- Card punches
- Tape punches
- Manual data conversion
- Paper tape and card to tape convertors
- Redundant data paths
- Wasted computer time



Cook Electric Is Always Near

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